Fluoroquinolone-Resistant *Campylobacter jejuni* Infections in the United States, 1997-2000: National Antimicrobial Resistance Monitoring System's Data lead to Regulatory Action

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Background: *Campylobacter* causes an estimated 2.4 million illnesses in the United States each year; 95% are due to one serotype, *Campylobacter jejuni* . Poultry is a common source of human *C. jejuni* infections. Fluoroquinolones (FQ) are bacteriocidal and are commonly used to treat *C. jejuni* infections in humans; macrolides (ML), although bacteriostatic, offer an alternative therapeutic choice. FQ were approved for use in poultry in 1995. We determined the prevalence of FQ and ML resistance in *C. jejuni* isolates from ill humans and chicken in grocery stores, and explored risk factors for human infections.

Methods: State health departments participating in the National Antimicrobial Resistance Monitoring System (NARMS) for enteric bacteria submitted *Campylobacter* isolates from ill humans and grocery-store-purchased chicken to CDC. CDC performed FQ (ciprofloxacin) and ML (erythromycin) resistance testing using E-test. A random sample of patients with *C. jejuni* isolates in 1997-1998 from participating NARMS sites were interviewed.
Results: From 1997 to 2000, 1018 human *C. jejuni* isolates were tested; 15% were FQ-resistant and 3% were ML-resistant. *C. jejuni* resistance to FQ was 12.9% in 1997 and 17.4% in 2000 while resistance to ML was 7.7% in 1997 and 1.5% in 2000. In 1999, 180 chickens from grocery stores were tested; *C. jejuni* was isolated from 79 (44%); strains from 19 (24%) were FQ resistant and none were ML resistant. Between 1997 and 1998, 37 patients with FQ-resistant *C. jejuni* infections were interviewed. Twenty-one of 37 (57%) patients with FQ resistant infections did not travel outside of the United States in the 7 days before illness onset. Among the 21 non-travelers, only one (5%) patient took a FQ prior to illness onset.

Conclusions: FQ resistance among *C. jejuni* isolates from ill humans and grocery-store-purchased chicken is common. The majority of FQ-resistant infections in humans were acquired domestically. These and other data contributed to a recent Food and Drug Administration (FDA) risk assessment that concluded that FQ use in poultry is contributing to FQ-resistant *Campylobacter* infections in humans. Subsequently, in December 2000, FDA proposed withdrawing the use of FQ in chickens and turkeys. As resistance to erythromycin among human *C. jejuni* isolates was low, macrolides may be a prudent choice for treatment of *Campylobacter* gastroenteritis.

Key words: *Campylobacter*, fluoroquinolones, antibiotic resistance, United States

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